

Master's Thesis Academic Year 2015

Interface Development for "People-House-Interactive HEMS"
: Using the Data of Dwelling Experiment in KEIO Co-Evolving House

Abstract: Increasing requests for saving energy is extending to common households because of the Great East Japan Earthquake and electricity deregulation, and the smart house which uses energy effectively by applying renewable energy and battery is getting a lot of attention. HEMS is a system that optimizes energy utilization by using IT. It aims at “visualization” of various information by using a monitor screen and “automatic control” of energy utilization. In order to realize “automatic control”, it is essential to accumulate human behavior. Therefore, this thesis defined “visualization” as an interface for “automatic control”. The purpose of this study is to develop the interface that improves user’s attitude and motivation for energy-saving and to accumulate knowledge to develop the interface by analyzing development process.

The first half of the thesis explains "KEIO Co-Evolving House" the platform for interface development, and its environmental sensors, BIM model, and simulation system, along with the hardware and software for data visualization. After that, the interface developed in this study is described.

In the latter half, an analysis of development process of the interface is described. It starts with “3D visualize program” developed in 2014 by Ikeda-lab, and five key issues are extracted through the development process. Furthermore, the latest version of the interface is evaluated in the five issues by utilization experiment in “KEIO Co-Evolving House”.

The latest version of the interface was able to assess in the five issues, but there remain points for improvement such as real-time display and feedback to the real space. In conclusion, this study was able to obtain beneficial knowledge accumulated through the development process of the interface.

Key Words:

HEMS, User Interface, BIM, Visualize, Interaction

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